Cumulative Air Quality Impacts Analysis
MEGS Project
(Revised 6/19/03)

At the request of the CEC staff, the Applicant has performed the following air quality cumulative impact analysis for the proposed MEGS project. This analysis was performed pursuant to the cumulative impact analysis protocol in the SPPEA for the MEGS project (SPPEA Appendix 8.1H). As discussed below, the cumulative impacts of the proposed project and other new/modified emission sources in the project area are not expected to cause a new violation or significantly contribute to an existing violation of any state or federal air quality standard in the project area.

The new and modified emissions sources in the MEGS project area were identified through a request of permit records from the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). The search was requested for new or modified emission sources located within 10 km of the project site that had a net emission increase of any size for NOx, CO, SOx, or PM_{10}. The database search focused on all new ATCs issued after January 1, 2000. This time period was selected based on the typical length of time needed for construction to ensure that projects that are not reflected in the ambient air quality data are included in the analysis. Based on the above search criteria, the SJVUAPCD performed a database search that identified a total of 13 emission sources that had been the subject of a permit application during the requested period. Nine of the identified sources either had no emissions listed or were modifications that resulted in emissions decreases. After the removal of these nine sources, the final list of new/modified sources was comprised of a total of 4 new/modified emission units.

Cumulative Emissions Impact

A detailed description of the 4 new/modified emission sources is included as Attachment 1. This list of new/modified sources includes the company name, company address, emission levels, and exhaust stack parameters. The emission levels for the 4 new/modified sources were provided by the SJVUAPCD as part of their database search. Because information regarding the exhaust stack characteristics of the sources was not available from the SJVUAPCD, it was necessary to use default stack parameters for the listed sources. The default stack parameters were derived from the following sources:

- Boiler default stack parameters – based on a 20 MMBtu/hr natural gas-fired boiler at an industrial facility in Fontana.
- Reciprocating internal combustion engine default stack parameters – based on parameters provided by the CEC for a Cummins Diesel engine rated at greater than 500 hp.

The emission characteristics and stack parameters for the proposed MEGS project are included in the air quality appendices of the SPPEA (SPPEA Appendix 8.1D), and will not be repeated here.

Using the methodologies outlined above, emissions were calculated on an hourly, daily, and annual basis for the MEGS project and the 4 new/modified sources. Tables 1, 2, and 3 show the hourly, daily, and annual emissions, respectively, for the MEGS project and 4 listed new/modified sources. The detailed emission calculations for the MEGS project are included in the SPPEA for the proposed project (SPPEA Appendix 8.1B) and will not be repeated in this report. As discussed above, the detailed emission summary for the 4 listed new/modified sources are included as Attachment 1.

Table 1
Maximum Hourly Emissions from Sources Included in Cumulative Impacts Analysis
(lbs/hr)

Emissions Source	NOx	CO	SOx	PM_{10}
MEGS Project	40.0	13.2	1.0	6.1
4 New/Modified Sources	16.3	4.0	0.4	0.5

Table 2
Maximum Daily Emissions from Sources Included in Cumulative Impacts Analysis
(lbs/day)

Emissions Source	NOx	CO	SOx	PM_{10}
MEGS Project	310.2	317.7	24.3	~~145.2~~146.4
4 New/Modified Sources	66.1	30.6	1.7	3.3

Table 3
Maximum Annual Emissions Included in Cumulative Impacts Analysis
(tons/year)

Emissions Source	NOx	CO	SO_x	PM_{10}
MEGS Project	45.3	58.0	4.4	26.7~~5~~
4 New/Modified Sources	2.3	3.6	0.04	0.4

Analysis of Ambient Impacts

As with the refined modeling performed for the MEGS project, the Industrial Source Complex Short Term, Version 3 (ISCST3) dispersion model was used to evaluate the combined impacts for the MEGS project and the 4 new/modified sources. The ISCST3 model is an EPA-guideline Gaussian dispersion model that numerically simulates the rise of pollutant emissions from sources (including individual stacks and area sources) and the way in which these emissions are transported by winds and diluted by turbulence in the atmosphere. The ISCST3 model was used with meteorological data collected during 1999 at the nearby Modesto Airport monitoring station. This was the meteorological data set used for the modeling analysis included in the SPPEA for the MEGS project (SPPEA Section 8.1.5.1.2). The SJVUAPCD has previously determined that this meteorological data set is representative of meteorological conditions in the MEGS project area. The coarse receptor grid used for the refined modeling performed for the MEGS project was also used for the cumulative impact analysis. A description of this receptor grid is included in the SPPEA for the MEGS project (SPPEA Section 8.1.5.1.2). Modeled hourly NO_2 impacts were ozone-limited using the ISC3-OLM model, which utilized hourly Modesto (14^{th} Street) concurrent ozone data. Modeling input and output files for the cumulative impacts analysis are included in the attached compact discs.

The turbine emissions sources associated with the MEGS project were modeled as individual point sources, using the stack parameters and emission rates included in the SPPEA (SPPEA Appendix 8.1D). The 4 new/modified sources were also modeled as individual point sources based on the emission levels and stack characteristics shown in Attachment 1.

The maximum modeled concentrations for each pollutant and averaging period from all sources combined are shown in Table 4, along with the individual contribution of the MEGS project and the 4 new/modified sources. For the MEGS project, Table 4 shows the maximum project impacts at any receptor location and the maximum project impact at the receptor location where the maximum cumulative impacts occur. The maximum modeled cumulative concentrations are summarized in Table 5 and compared with the state and federal ambient air quality standards.

Table 4
Source Contribution to Maximum Modeled Concentration
(all concentrations in ug/m^3)

Pollutant/ Avg. Period	Maximum Modeled Impact for MEGS Project	Maximum Modeled Impact for 4 New/Modified Sources	Combined Maximum Modeled Impact for MEGS Project and 4 New/Modified Sources	MEGS Project's Contribution to Point of Maximum Combined Impact
NO_2				
- annual	0.03	0.43	0.43[a]	0.00[a]
- 1 hour	1.7[a]	185.6[a]	185.6	0.0
CO				
- 8 hours	0.4	18.1	18.1	0.0
- 1 hour	2.5	53.4	53.4	0.0
SO_2				
- annual	0.003	0.011	0.012	0.001
- 24 hours	0.01	0.28	0.28	0.00
- 1 hour	0.2	10.0	10.0	0.0
PM_{10}				
- annual	0.130	0.09	0.141	0.130
- 24 hours	0.4552	0.32	0.4552	0.4552

Notes:
a. OLM corrected using ISC3-OLM.

Table 5
Comparison of Maximum Modeled Concentrations with
Ambient Air Quality Standards
(all concentrations in ug/m^3)

Pollutant/ Avg. Period	Max. Modeled Impact from All Sources	Background Concentration	Total	Federal Standard	State Standard
NO_2					
- annual	0.43	41.4	41.8	100	--
- 1 hour	185.6	194	379.6	--	470
CO					
- 8 hours	18.1	8,353	8,371	10,000	10,000
- 1 hour	53.4	13,045	13,098	40,000	23,000
SO_2					
- annual	0.012	5.2	5.2	80	--
- 24 hours	0.28	23.6	23.9	365	109
- 1 hour	10.0	76	86	--	650
PM_{10}					
- annual[1]	0.141	41	41.1	50	--
- 24 hours	0.5245	158	158.545	150	50

Notes:
1. Annual arithmetic mean.

As shown on Table 4, at the point of maximum combined impact, there is very little overlap between the MEGS project and the 4 new/modified sources. For many of the pollutants and averaging periods, the MEGS sources' contribution at the point of

maximum combined impact is almost nondetectable by the ISCST3 model. The modeling results show that the maximum combined impacts of the MEGS project and the 4 new/modified projects are not expected to cause any violations of the state or federal CO, SO_2, or NO_2 standards. In addition, the modeled PM_{10} impacts by themselves are well below federal and state ambient air quality standards. However, since the federal and state PM_{10} standards are already exceeded in the area, any increase in ambient PM_{10} levels will contribute to an existing violation. From the information about source contributions in Table 4, it can be seen that these projected violations would occur even without the proposed MEGS project. In addition, under the SJVUAPCD permitting program, the MEGS project is required to offset PM_{10} emissions increases. Consequently, the MEGS project is not expected to cause a new violation or contribute significantly to an existing violation of any state or federal air quality standard in the project area.

ATTACHMENT 1

EMISSION LEVELS AND STACK PARAMETERS FOR 4 NEW/MODIFIED SOURCES